NASA-Unified WRF simulations for OLYMPEX IOPs

**Takamichi Iguchi*[1,2](takamichi.iguchi@nasa.gov), Xiaowen Li[2,3], Wei-Kuo Tao[2]**

1:Earth System Science Interdisciplinary Center, University of Maryland College Park, 2: NASA Goddard Space Flight Center, and 3: Goddard Earth Sciences Technology and Research/Morgan State University

SIMULATION CONFIGURATION

NASA-Unified WRF (NU-WRF) hindcasts for three Interest of periods (IOPs) in the Olympic Mountain Experiment (OLYMPEX) field campaign. The simulation results have been investigated upon intercomparison with different microphysics schemes and comparison with IMERG ver.4.

Time	Description	Type	In-situ	GPM
12 November 11/12 00Z– 11/14 00Z	Aircraft and Radars Observed Warm Moist Prefrontal Flow Impinging on the Olympic Mountains	Rain	X	
3 December 12/02 12Z– 12/04 00Z	A Complex Baroclinic System with Orographically Enhanced Rain and a GPM Overpass over Olympic Mountains	Rain	X	12/03 15:22:17
20 December 12/20 00Z – 12/21 00Z	Significant Snowfall From a Series of Shortwaves Followed by Widespread Postfrontal Convection	Snow		

NU-WRF version 8 patch 4, based on NCAR WRF-ARW version 3.7.1
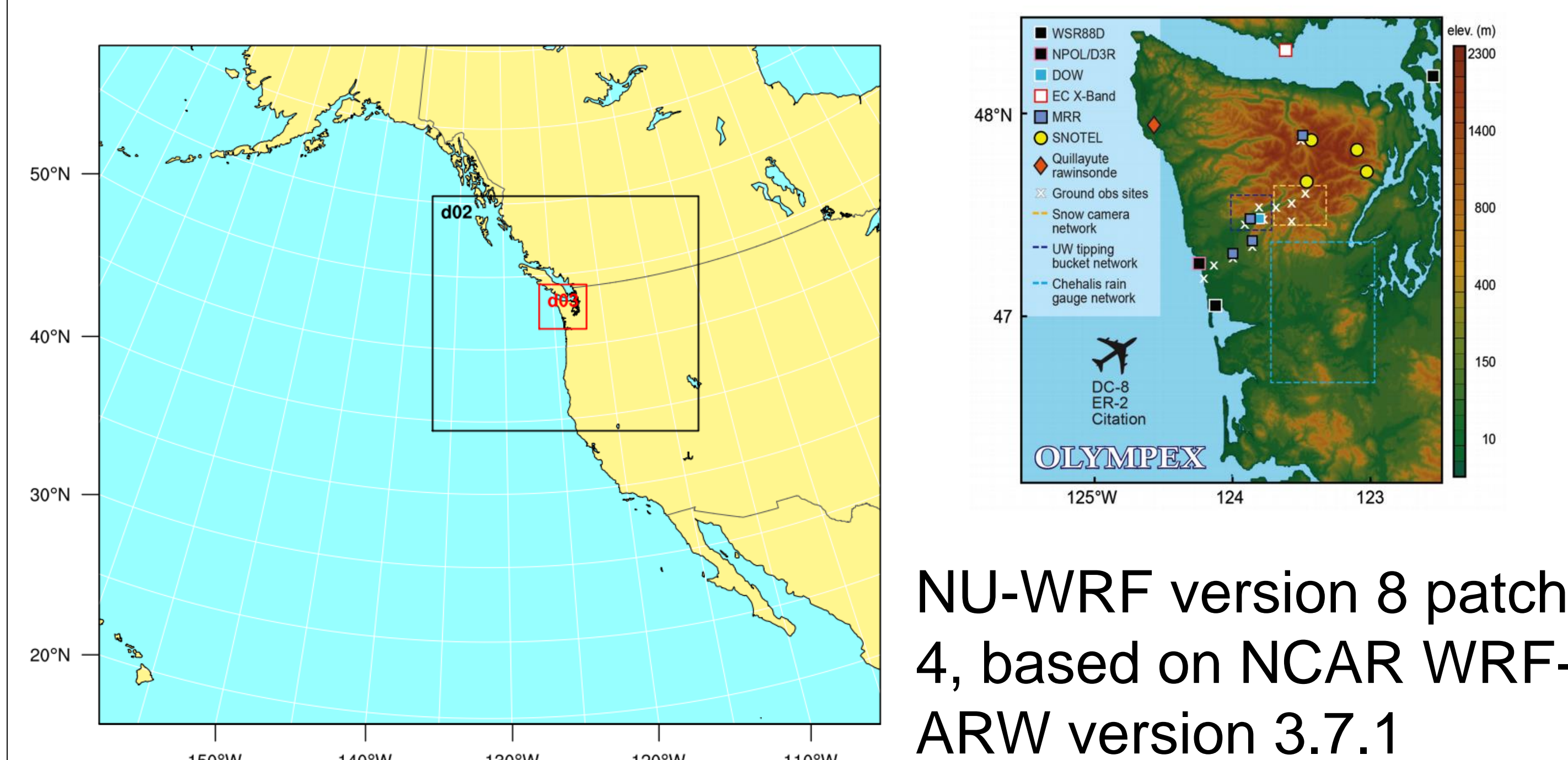
Three nested domain (9km, 3km, and 1km) with 60 vertical layers.
9km (670,581), 3km (684,603), 1km (366,342)

Physics:
Goddard 4ICE Microphysics, Goddard Radiation, MYJ planetary boundary layer, Noah surface, Eta surface layer scheme.

Different cloud microphysics schemes:
Goddard 4ICE scheme
WSM6 scheme
Morrison 2-moment scheme
Spectral bin microphysics (currently, only for 1-km domain03 in the December 2, 2015 case)

RESULTS

1-h accumulated d02 surface precipitation

IMERG ver.4 precCal	NU-WRF GCE4ICE	NU-WRF Morrion2M	NU-WRF WSM6

11/12/2015 1800-1900 UTC

12/03/2015 1500-1600 UTC

12/20/2015 0900-1000 UTC

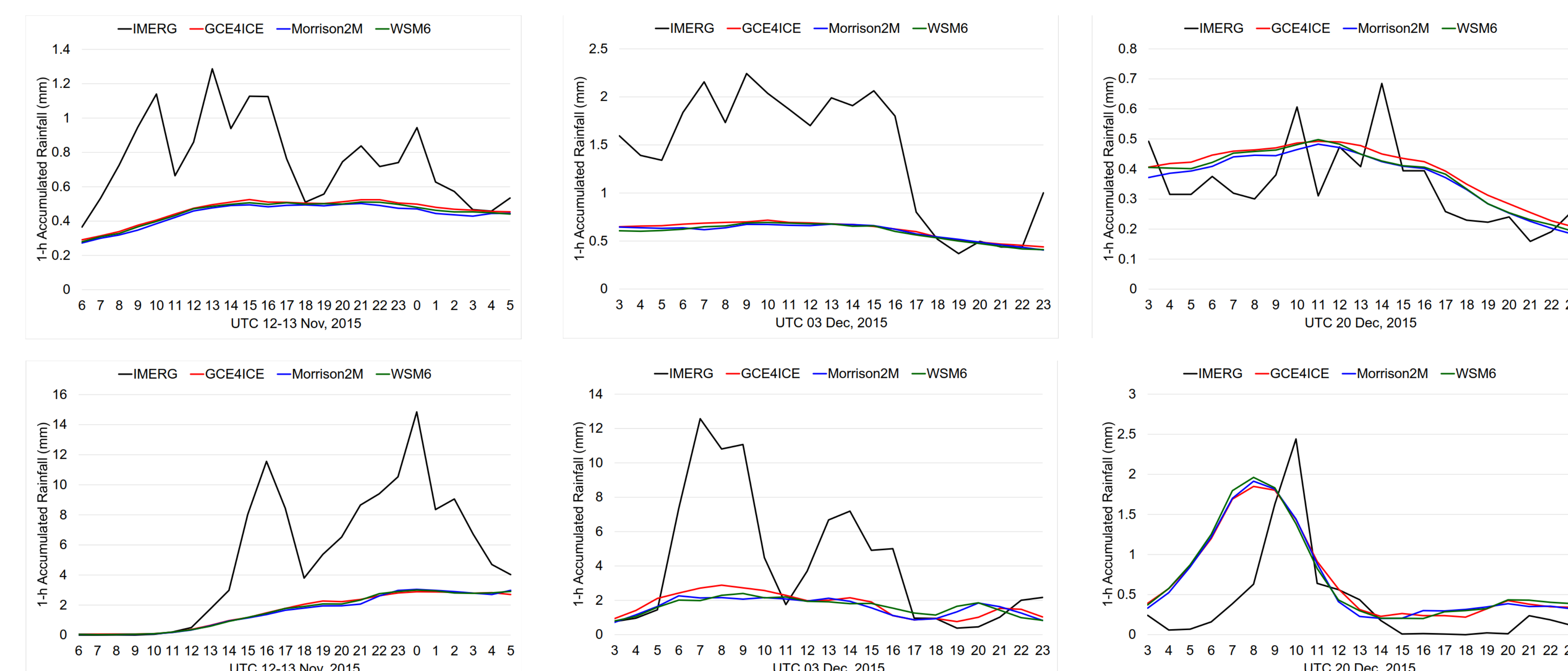**Time-series of 1-h accumulated surface precipitation**

Domain 02 Average

Domain 03 Average

NU-WRF simulations underpredicted accumulated surface rainfall in the 1st and 2nd cases, regardless of the selection of the microphysics scheme and the domain. In contrast, the simulated rainfall amounts on average are in agreement with those in IMERG relatively. These contrasting results may be due to the difference of surface precipitation type in these cases.